Beryllium-Associated Worker Registry Data Collection and Management Guidance

Department of Energy
10 CFR Part 850

Beryllium-Associated Worker Registry
Data Collection and Management Guidance

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Beryllium-Associated Worker Registry
Data Collection and Management Guidance

Background

The Beryllium-Associated Worker Registry is a complex-wide internal Department of Energy (DOE) program to help DOE conduct and improve its environmental, safety and heath programs regarding past, current, and future beryllium exposure and related health effects. Title 10 Code of Federal Regulations, Part 850 (10 CFR 850), specifies beryllium surveillance requirements for both DOE federal and contractor employees. The Registry will assist DOE in understanding the effectiveness of efforts to reduce exposure to beryllium. It will contain data on DOE contractor and federal workers and the jobs they performed while exposed to beryllium, results from screening tests for chronic beryllium disease, and the results from subsequent medical diagnostic procedures. Policy, guidelines and directives for the Registry are determined at DOE headquarters by the Office of Health Programs (EH-6). The Registry is maintained by the Beryllium Registry Data Center at the Oak Ridge Institute for Science and Education (ORISE), Oak Ridge, Tennessee.

The Registry includes several components called *data sets*. These data sets include: a roster, or listing of all current workers who are exposed to, or were previously exposed to beryllium, medical information related to signs and symptoms of beryllium related disease, work history and tasks while employed at a DOE site, work history and tasks while employed at non-DOE sites, and exposure data (industrial hygiene sampling data) for DOE and exposure data for non-DOE sites.

Data Sources

Sources of information for these data include human resource organizations; medical, safety, and industrial hygiene organizations; and other organizations such as operations, maintenance, engineering, and payroll. Additional sources of information may include Workers' Compensation files, the OSHA Form 200 log, and headquarters managed databases such as the Computerized Accident and Illness Reporting System (CAIRS), the Occurrence Reporting and Processing System (ORPS), and the Occurrence Reporting Binned Information Trending Tool (ORBITT).

In the event that a worker who is enrolled in the Registry dies, information regarding the cause of death should be entered into the Registry. This information is available from a death certificate, which may be available through the occupational medicine clinic or human resource departments. If a death certificate is not available, the cause of death information may sometimes be obtained from the medical record.

Site Registry Coordinator

A Registry coordinator must be identified at each DOE site to serve as the point of contact between the site and the Beryllium Registry Data Center at Oak Ridge. The Registry coordinator is responsible for coordinating activities at the site related to data collection, submitting data to the Data Center in a timely manner, receiving inquiries from the Data Center, contacting appropriate site personnel to resolve data management and collection issues, and correcting errors. It is expected that the Registry coordinator will interact with a variety of individuals at the site such as line managers, computer support personnel, industrial hygienists, and site medical clinic personnel.

Data Submission

Each site should define the best file structure and transmitting protocol for their site, in coordination with the Beryllium Registry Data Center. All data *must* be submitted as electronic files. The Data Center is flexible as to file type and will work with each site individually to accommodate various computer systems.

Data submission should begin as soon as possible. All sites must have fully functioning data submission procedures in place no later than the 10 CFR 850 implementation date of January 7, 2002. Initial submissions to the Registry should include all available data for all current beryllium-associated workers.

Data must be submitted semi-annually to the Beryllium Registry Data Center at ORISE. The reporting periods begin on January 1 and July 1. Data should be submitted within 30 days of the reporting period to:

The Beryllium Registry Data Center
ORISE Center for Epidemiologic Research
P.O. Box 117
Oak Ridge, TN 37831-0117

ORISE data coordinator: Phil Wallace
Phone: (865) 576-3142
Fax: (865) 576-9557
Email: wallacep@orau.gov

The Beryllium Registry is managed at DOE headquarters by:

Office of Health Programs (EH-6)
19901 Germantown Road
Germantown, MD 20874-1290
Program manager: Dr. Bonnie S. Richter
Phone: (301) 903-4501
Email: bonnie.richter@eh.doe.gov

Worker Confidentiality Protection

As indicated in the Beryllium Rule, the purpose of the Beryllium Registry is to help DOE in its mission to protect worker health. This can only be done if we know what factors place our workers at risk for developing sensitization or chronic beryllium disease so that these risks can be mitigated where possible. The Beryllium Registry contains de-identified data, that is, names, addresses, and other personal identifying information (such as social security numbers) are not included in the database. The data is not available for use in research studies where investigators must identify individuals. Please note that the Beryllium Registry is explicitly exempt from Institutional Review Board review of research protocols under 10 CFR 745 section 101 (b)(4) that deals with Federal Policy for the Protection of Human Subjects, as the subjects cannot be identified, directly or through identifiers linked to subjects.

To help maintain the confidentiality of Registry data, the Registry coordinator must insure that a unique, encrypted identification number is assigned to every worker included in the Registry. All information that is submitted to the Registry, regarding a specific worker, must include his or her unique encrypted identification number. As the health impact of beryllium exposure may not occur until many years after employment, the Registry coordinator must insure that a system is maintained that links a worker's identity to his or her unique identification number, even after the worker terminates employment.

Unique encrypted identifiers should not be overly simplistic, such as reversing the worker's social security number, and should not duplicate other existing identifiers. The unique identifier should not be re-assigned to a different worker, even if the first worker assigned to the identifier exits the workforce at that respective site. Should this worker return to the workforce at this site, his or her unique number should be restored to this specific individual. Sites that are participating in the Epidemiologic Surveillance Program (ESP) should use the previously assigned ESP identification number as the unique encrypted identifier.

When a worker transfers from one DOE site to another, he or she will be reassigned a new unique encrypted identifier, coded according to the current site's encryption scheme. Former sites should advise the transferees to identify themselves as a beryllium-associated worker to the site occupational medicine director (SOMD) upon their arrival at the new site. The SOMD should also determine if transferred workers were included in the Beryllium Registry at the previous site. If so, the SOMD will contact the SOMD at the previous site to obtain the old identification number so that linkages can be made.

To maintain the confidential nature of the Registry, 10 CFR 850.39 (e)(2)(i) requires that the SOMD, or other designated site personnel within the occupational medicine clinic retain the encryption key that identifies an individual worker to his or her unique identifier. Proper security, such as restricted access and locked files must be maintained.

ROSTER OF BERYLLIUM-ASSOCIATED WORKERS

The Roster Data Set is a compilation of all beryllium-associated workers. The Registry coordinator shall establish the initial roster and submit it to the Data Center. The roster must include all (DOE and contractor) workers who are defined as beryllium-associated workers by 10 CFR 850. Fields marked with an asterisk (*) are required.

Table 1. Roster

	Name	**Description**
1.	*Site Code	Site code (provided by ORISE Data Center)
2.	*Unique ID	Unique worker identification number (to be determined by site)
3.	*Status Code	N = new record C = change to a record
4.	*YearBorn	Year of birth
5.	*Gender	Gender of worker
6.	Race	If collected by the site
7.	*Employer Type	Indicate the worker's employer as federal, contractor, subcontractor, or visitor
8.	*Date Employment Ended	Date that employment with the current employer ended
9.	*Death Date	Date of death
10.	Immediate Cause	Text abstracted from death certificate, immediate cause
11.	First Cause	Text abstracted from death certificate, first "Due to or as a consequence of" section

12.	Second Cause	Text abstracted from death certificate, second "Due to or as a consequence of" section
13.	Other Cause	Other significant conditions contributing to the death
14.	*Old Unique ID	Unique ID from previous site, if applicable
15.	*Previous Site	Text field that contains the name of the previous site where the worker was employed as a beryllium worker.

1. Site Code: A unique code that identifies a site. The Beryllium Registry Data Center will provide a site code to each Registry coordinator. Sites currently participating in the Epidemiologic Surveillance Program (ESP) should use their current site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the ESP should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new record (“N”) for a worker entering the roster or a change record ("C") of a worker already in the roster. See "New and Change Records and Required Fields" section for additional discussion.

4. Year Born: Only the year of birth is requested in the Roster data set. This is a measure to help ensure privacy and prevent identification of individuals by using a specific date of birth.

5. Gender: Provide the code for the gender of the worker as either male or female.

6. Race: Provide race if captured by the site.

7. Employer Type: Indicate the worker's current employment type as federal, contractor, sub-contractor or visitor. Primary subcontractors to a site integrating contractor are considered a contractor for the Registry. Visitors include visiting scientists, graduate students, research collaborators, etc.

8. Date Employment End: Provide the month and year that the worker terminated employment or ceased visiting the site. Current workers should have a blank (null) value in the Date Employment Ended field.

9. Death Date: Date on which worker's death occurred.

10. Immediate Cause: Text describing the immediate cause of death. Abstract "immediate cause of death" section from the death certificate.

11. First Cause: Text describing the first contributing cause of death. Abstract first "due to, or as a consequence of" section from the death certificate.

12. Second Cause: Text describing the second contributing cause of death. Abstract second "due to, or as a consequence of" section from the death certificate.

13. Other Cause: Text describing other significant conditions identified as contributing cause(s) of death, but not related to the immediate cause of death.

14. Old Unique ID: Unique ID from previous site (for workers who have transferred from one DOE site to another DOE site).

15. Previous Site: This is a text field that contains the name of the most previous site the worker was employed at as a beryllium-associated worker and was submitted to the Registry from that site. Examples of values: Sandia, LANL, Rocky Flats. (Site names can be abbreviated and will be changed to a code number by the Registry Data Center.)

BERYLLIUM-RELATED MEDICAL SURVEILLANCE

The beryllium-related medical surveillance data set contains the beryllium-related disease medical information obtained by the Site Occupational Medicine Director related to beryllium exposure and diagnostic testing.

Table 2. Medical Surveillance

	Name	Description
1.	*Site Code	Site code (provided by ORISE Data Center)
2.	*Unique ID	Unique identifier (to be determined by the site)
3.	*Status Code	N= new record C= changed record
4.	*LPT result	LPT test result : Normal (Negative), Abnormal (Positive), Refused, Borderline
5.	*LPT date	Date of blood draw for the LPT test
6.	SMOKE	Smoking status : Current (C) , Former (F), Never (N), Unknown (U)
7.	CXR Result	Chest X-Ray results
8.	Date CXR	Date chest Xray
9.	FVC	Results of spirometry test – forced vital capacity
10.	FEV1	Results of spirometry test (forced expiratory volume) at 1.0 second
11.	FEV1/FVC	Results of spirometry test
12.	FEV2575	Results of spirometry test between 25%-75% of forced vital capacity

	Name	Description
13.	Spirometry Date	Date spirometry test administered
14.	DLCO	Result of carbon monoxide diffusion test (DLCO)
15.	DLCO Date	Date carbon monoxide diffusion test administered
16.	Follow-up Referral	Accepted (Y) or declined (N) referral for diagnostic follow-up
17.	Referral Offered Date	Date follow-up referral offered
18.	Lavage Result	Bronchoalveolar lavage results
19.	Date Lavage	Date of bronchoalveolar lavage
20.	BX Result	Transbronchial biopsy result
21.	Date BX	Date of transbronchial biopsy
22.	CBD Result	CBD evaluation result
23.	CBD Date	Date CBD evaluation made
24.	Dermatitis Positive	Be-induced dermatitis diagnosed - Positive (P), Negative (N), Equivocal (E)
25.	Date of Dermatitis	Date Be-induced dermatitis diagnosed
26.	Other Be Diagnoses	Other beryllium-related diagnoses

	Name	Description
27.	Date of Other Be Diagnoses	Date other beryllium-related diagnoses made

1. Site Code: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the ESP should continue to use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the ESP should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change record ("C") in the beryllium medical surveillance data set. See "New and Change Records and Required Fields" section for additional discussion.

4. LPT result: Provide the result of the Be-LPT test as Normal (Negative), Abnormal (Positive), Refused, or Borderline (neither fully normal or fully abnormal). Note: lung function test results (fields 9-13) may be available even if the LPT is Normal or Negative.

5. LPT date: Provide the date the blood was drawn for the Be-LPT (MM/DD/YYYY).

6. SMOKE: Indicate the worker's smoking status as: Current (C), Former (F), Never (N) , or if there are no data available, put Unknown (U).

7. CXR Result: Indicate result of chest X-ray according to the ILO (International Labor Organization code), e.g. 0/0, or 0/1.

8. Date CXR: Provide the date the chest X-Ray was taken (MM/DD/YYYY)

9. FVC: Spirometry result. FVC is “forced vital capacity” and is reported as percent of normal expected for a person of the worker’s size, age, and gender. Give value as a decimal , e.g .75.

10. FEV1: Spirometry result. $FEV_{1.0}$ is the “forced expiratory volume at 1.0 second" and is reported as percent of normal expected for a person of the worker’s size, age, and gender. Give value as a decimal.

11. FEV1/FVC: Results should be available with the FVC and FEV1 test results. This is typically reported as a decimal number.

12. FEV2575: Spirometry result. $FEV_{.25-.75}$ is the "forced expiratory volume between 25% and 75% of the total forced expiratory volume" and is reported as percent of normal expected for a person of the worker's size, age, and gender. Give as a decimal.

13. Spirometry Date: Date the spirometry test was administered (MM/DD/YYYY).

14. DLCO: Results of carbon monoxide diffusion test that measures the ability of carbon monoxide to diffuse between lung cells and the blood stream. Given in percent carboxyhemoglobin saturation.

15. DLCO Date: Date DLCO test was administered (MM/DD/YYYY).

16. Follow-up Referral: Indicate whether this individual accepted (Y) or declined (N) a referral for a follow-up examination.

17. Referral Offered Date: Indicate date the follow-up referral was offered (MM/DD/YYYY).

18. Lavage Result: Provide results of the bronchoalveolar lavage as either positive, negative, or equivocal (neither fully positive nor fully negative), or supply result in text format.

19. Date Lavage: Provide the date the bronchoalveolar lavage was administered (MM/DD/YYYY) .

20. BX Result: Indicate transbronchial biopsy result - suggested values are : negative, positive-granuloma, positive-alveolitis, and positive-interstitial thickening. Indicate all that apply. Other values and comments may be provided.

21. Date BX: Provide the date the transbronchial biopsy was administered (MM/DD/YYYY).

22. CBD Result: Indicate CBD evaluation result. Suggested values are the 3 that are being used in the former worker surveillance program: CBDA, CBDB, and CBDC. Definitions are in Appendix A.

23. CBD Date: Indicate the date that the CBD evaluation was complete (MM/DD/YYYY).

24. Dermatitis Positive: Indicate whether beryllium induced dermatitis was diagnosed as: Positive (P), Negative (N), or if neither fully positive nor fully negative, put Equivocal (E).

25. Date Dermatitis: Indicate the date of dermatitis diagnosis (MM/DD/YYYY).

26. Other Be Diagnoses: Provide any other beryllium-related diagnosis(es). Use the standard diagnostic nomenclature; include ICD code if known.

27. Date of Other Be Diagnoses: Indicate the date of other diagnosis(es) (MM/DD/YYYY).

DOE BERYLLIUM WORK HISTORY, PROCESS, AND EXPOSURE DATA

The Beryllium Work History, Process, and Exposure Data Sets contain information concerning all beryllium-associated activities where the worker currently works or previously had worked and the exposures associated with those activities. The data should include working directly with beryllium, working in areas of potential beryllium exposure even if not working directly with beryllium, and activities with potential casual exposure to beryllium, such as working near an area where others are working directly with beryllium. Do not provide or submit classified data to the Registry.

Table 3. DOE Beryllium Work History

	Name	**Description**
1	*Site Code	Site code (provided by ORISE Data Center)
2	*Unique ID	Unique employee identifier (provided by data coordinator)
3.	*Status Code	N = new record C = change to a record
4.	Organization Code	Department/division/organization
5.	*Activity	General description of the job function
6.	*Job Title	Job title at time of Be exposure
7.	*Job Start Date	Date job involving beryllium began
8.	*Job Stop Date	Date job involving beryllium stopped

1. SiteCode: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the ESP should continue to

use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the ESP should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change ("C") record for a worker's beryllium work history. See "New and Change Records and Required Fields" section for additional discussion.

4. Organization Code: Provide the worker's department, division, or organization code or number. The Registry coordinator must provide a data dictionary (the code and the organization associated with that code) to the Data Center.

5. Activity: A high level roll-up category that is a general description of the job function, e.g. administration, research, production, decontamination and decommissioning.

6. Job Title: Provide the worker's job title at time of exposure, (e.g. Machinist, QA Laboratory Technician, Chemical Operator).

7. Job Start Date: Provide the date the worker began working in the job in which he or she was potentially or actually exposed to beryllium (MM/DD/YYYY).

8. Job Stop Date: Provide the date the worker stopped working in the job in which he or she was actually or potentially exposed to beryllium (MM/DD/YYYY).

Table 4. DOE Beryllium Task 8-Hour Time Weighted Average

1.	*Site Code	Site code (provided by ORISE Data Center)
2.	*Unique ID	Unique employee identifier (provided by data coordinator)
3.	*Status Code	N = new record C = change to a record

4.	*Monitoring Date	Date monitoring was conducted MM/DD/YYYY
5.	*Monitoring Shift	Shift on which monitoring was conducted
6.	*8hrTWA	8-hour time weighted average exposure level or limit of quantitation in $\mu g/m^3$
7.	*TWA<LOQ	Indicate whether the 8-hrTWA is less than the limit of quantitation, Y/N.

1. Site Code: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the Epidemiologic Surveillance Program should continue to use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the Epidemiologic Surveillance Program (ESP) should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change ("C") record for a worker's beryllium task. See "New and Change Records and Required Fields" section for additional discussion.

5. Monitoring Date: The date on which the monitoring was conducted that generated the exposure level used in calculating the 8hrTWA (field 6). Use the date of the first day if the monitoring spans midnight.

6. Monitoring Shift: Shift in which exposure monitoring was conducted that generated the exposure level used in calculating the 8hrTWA (field 6). Typical shift values are: 1) first, 2) second, or 3) third

7. 8hrTWA: Provide the 8-hour TWA (time weighted average) of the worker's beryllium exposure for the Task (field 8 in Table 5) as determined by personal monitoring of the worker, or by the representative monitoring of other workers, or presumed by some other method. The industrial hygienist must calculate the 8-hour TWA before submitting the data to the Registry coordinator. TWAs based on other time periods, e.g., 9-or 10-hour TWAs, must be recalculated as the 8-hour TWA. If monitoring results show no detectable levels of beryllium, the exposure

level should be recorded as the limit of quantitation of the sampling and analytical method used (e.g., 0.01 μg/m^3) . The limit of quantitation is defined as the lowest concentration that can be reported reliably, that is, with a high degree of statistical certainty (Quality Assurance Manual for Industrial Hygiene Chemistry, American Industrial Hygiene Association, Sampling and Laboratory Analysis Committee, 1995, pages 36-38).

8. TWA<LOQ: Indicate by Y/N whether the value reported in field 6 is the 8-hour TWA limit of quantitation rather than the actually measured and calculated TWA exposure level. "Yes" indicates that the value reported in field 6 is the 8-hour TWA level of quantitation.

Table 5. DOE Beryllium Activities and Exposure

	Name	Description
1.	*Site Code	Site code (provided by ORISE Data Center)
2.	*Unique ID	Unique employee identifier (provided by data coordinator)
3.	*Status Code	N = new record C = change to a record
4.	*Building Code	Building where the exposure occurred
5.	*Room/Area	Room/area where exposure occurred
6.	*Process	Free form text describing beryllium activity process
7.	*Operation	Free form text describing the beryllium activity operation
8.	*Task	Free form text describing the beryllium activity task
9.	*Actual Exposure	Actual exposure level or limit of quantitation during the sampling period in μg/m^3
10.	*Actual Exposure<LOD	Indicate whether the actual exposure is less than the limit of quantitation, Y/N.

11.	Exposure Duration	Number of hours of exposure from performing Task (field 8)
12.	Exposure Method	Type of exposure method: Individual (I), Representative (R), Presumed (P)
13.	Sampling Method	Describe the sampling method used
14.	Analytic Method	Describe the analytic method used
15.	*Exposure Sampling Time	Exposure sampling time (min.)
16.	*Sample Number	Sample identification number
17.	*Monitoring Date	Date monitoring was conducted - MM/DD/YYYY
18.	*Monitoring shift	Shift monitoring was conducted
19.	Chemical	Free form text describing beryllium chemical compound
20.	Engineering Controls	Free form text describing engineering controls
21.	PPC&E	Personal protective clothing and equipment used? Y/N
22.	*Respirator Protection	Respiratory protection used? Y/N
23.	*Respirator APF	Respiratory protection Applied Protection Factor

1. Site Code: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the Epidemiologic Surveillance Program should continue to use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the Epidemiologic Surveillance Program (ESP) should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change ("C") record for a worker's beryllium exposure. See "New and Change Records and Required Fields" section for additional discussion.

4. Building Code: Provide the on-site code for the building within which the beryllium exposure occurred. This is the unique administrative code that usually is established by the facility or property management organization for each building on site. The Registry coordinator must provide a data dictionary (the code and the building associated with that code) to the Data Center.

5. Room/area: Provide the room number or other identifier of the area where the beryllium exposure occurred.

6. Process: Free form text that describes the beryllium activity process. Process is the highest level of grouped tasks. Dry machining is an example of a process. See Appendix C for more examples.

7. Operation: Free form text that describes the beryllium activity operation. Operation is the mid-level of grouped tasks. Using a particular type of lathe is an example of an operation in the dry machining process. See Appendix C for more examples.

8. Task: Free form text that describes the beryllium activity task. Task is the lowest level of beryllium activity and is not grouped. Machine preparation is an example of a task performed in the operation of using a particular type of lathe. See Appendix C for more examples.

9. Actual Exposure: Provide the actual level of the worker's beryllium exposure during the sampling period for the Task (field 8) as determined by personal monitoring of the worker or by the representative monitoring of other workers, or presumed by some other method. (Indicate the exposure method in Exposure Method (field 12).) The industrial hygienist must calculate the actual exposure before submitting data to the site Registry coordinator. The exposure level should be reported as the limit of quantitation if the monitoring result does not exceed that level (e.g., 0.01 $\mu g/m^3$) . The limit of quantitation is defined as the lowest concentration that can be reported reliably, that is, with a high degree of statistical certainty (Quality Assurance Manual for Industrial Hygiene Chemistry, American Industrial Hygiene Association, Sampling and Laboratory Analysis Committee, 1995, pages 36-38).

10. Actual Exposure <LOQ: Indicate by Y/N whether the value reported in Actual Exposure (field 9) is the actual exposure limit of quantitation rather than the actual measured exposure

level. "Yes" indicates that the value reported in field 9 is the actual exposure level of quantitation.

11. Exposure Duration: Provide the number of hours in the reporting period during which the worker worked on the task described in the Task (field 8), if possible. Although optional, efforts should be made to collect these data. Sources of this information often include supervisor's production records, payroll records, completed work packages, and regulated area sign-in sheets.

12. Exposure Method: Provide the type of exposure method. Individual (I) indicates that the exposure level was obtained from samples that were taken in this worker's breathing zone. Representative (R) indicates that the exposure value was obtained from samples that were taken in the breathing zones of other workers who were performing tasks similar to the task described in Task (field 8). Presumed (P) indicates that the exposure value was estimated by some other method, including subjective methods.

13. Sampling Method: Describe the sampling method used.

14. Analytic Method: Describe the analytic method used.

15. Exposure Sampling Time: The length of time of the sampling that generated the actual sample exposure level, Actual Exposure (field 9), or analogous time for exposure levels that were obtained from samples that were taken in the breathing zones of other workers who were performing tasks similar to the task described in Task (field 8), or were presumed by estimating by some other method, including subjective methods.

16. Sample Number: Identifying number assigned to the sample that generated Actual Exposure (field 9) for tracking purposes. Sites must ensure that the sample number does not identify the employee.

17. Monitoring Date: The date on which the monitoring was conducted that generated the actual exposure level used in calculating the 8hrTWA (field 6 in Table 4). Use the date of the first day if the monitoring spans midnight.

18. Monitoring Shift: Shift in which exposure monitoring was conducted that generated the actual exposure level used in calculating the 8hrTWA (field 6 in Table 4). Typical shift values are: 1) first, 2) second, or 3) third.

19. Chemical: Free form text that identifies the chemical composition of the beryllium being monitored.

20. Engineering Controls: Free form text used to indicate type of engineering controls used with the Task (field 8).

21. PPC&E: Indicate whether personal protective clothing and equipment was used with the Task (field 8).

22. Respirator Protection: Indicate whether respiratory protection was used with the Task (field 8).

23. Respirator APF: Provide the Applied Protection Factor for respiratory protection when it was used for the Task (field 8).

NON-DOE OCCUPATIONAL BERYLLIUM ACTIVITIES AND EXPOSURE

Complete work histories and exposure profiles for workers would allow DOE to better understand, and therefore control, chronic beryllium disease. DOE would like to include occupational beryllium exposure information from non-DOE workplaces, if available. The information requested in the next set of tables is not required by 10 CFR 850, but is highly desirable.

Tables 6, 7, and 8 replicate the information requested in the previous tables (Tables 3,4,5). All definitions stay the same with the exception of adding field 3A to the table 6, which is used to identify who the non-DOE employer was and the location.

Table 6. Non-DOE Beryllium Work History

	Name	**Description**
1	*Site Code	Site code (provided by ORISE Data Center)
2	*Unique ID	Unique employee identifier (provided by data coordinator)
3.	*Status Code	N = new record C = change to a record
3A.	Non-Doe	Identify the non-DOE employer and site location
4.	Organization Code	Department/division/organization
5.	*Activity	General description of the job function
6.	*Job Title	Job title at time of Be exposure
7.	*Job Start Date	Date job involving beryllium began
8.	*Job Stop Date	Date job involving beryllium stopped

1. SiteCode: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the ESP should continue to use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the ESP should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change ("C") record for a worker's beryllium work history. See "New and Change Records and Required Fields" section for additional discussion.

3A. Non-Doe : The name and location of the non-DOE employer or where the worker was exposed or potentially exposed to beryllium, or was classified as a beryllium worker.

4. Organization Code: Provide the worker's department, division, or organization code or number. The Registry coordinator must provide a data dictionary (the code and the organization associated with that code) to the Data Center.

5. Activity: A high level roll-up category that is a general description of the job function, e.g. administration, research, production, decontamination and decommissioning.

6. Job Title: Provide the worker's job title at time of exposure, (e.g. Machinist, QA Laboratory Technician, Chemical Operator).

7. Job Start Date: Provide the date the worker began working in the job in which he or she was potentially or actually exposed to beryllium (MM/DD/YYYY).

8. Job Stop Date: Provide the date the worker stopped working in the job in which he or she was actually or potentially exposed to beryllium (MM/DD/YYYY).

Table 7. Non-DOE Beryllium Task 8-Hour Time Weighted Average

1.	*Site Code	Site code (provided by ORISE Data Center)
2.	*Unique ID	Unique employee identifier (provided by data coordinator)

3.	*Status Code	N = new record C = change to a record
4.	*Monitoring Date	Date monitoring was conducted MM/DD/YYYY
5.	*Monitoring Shift	Shift on which monitoring was conducted
6.	*8hrTWA	8-hour time weighted average exposure level or limit of quantitation in $\mu g/m^3$
7.	*TWA<LOQ	Indicate whether the 8-hrTWA is less than the limit of quantitation, Y/N.

1. Site Code: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the Epidemiologic Surveillance Program should continue to use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the Epidemiologic Surveillance Program (ESP) should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change ("C") record for a worker's beryllium task. See "New and Change Records and Required Fields" section for additional discussion.

4. Monitoring Date: The date on which the monitoring was conducted that generated the exposure level used in calculating the 8hrTWA (field 6). Use the date of the first day if the monitoring spans midnight.

5. Monitoring Shift: Shift in which exposure monitoring was conducted that generated the exposure level used in calculating the 8hrTWA (field 6). Typical shift values are: 1) first, 2) second, or 3) third

6. 8hrTWA: Provide the 8-hour TWA (time weighted average) of the worker's beryllium exposure for the Task (field 8 in Table 8) as determined by personal monitoring of the worker, or

by the representative monitoring of other workers, or presumed by some other method. The industrial hygienist must calculate the 8-hour TWA before submitting the data to the Registry coordinator. TWAs based on other time periods, e.g., 9-or 10-hour TWAs, must be recalculated as the 8-hour TWA. If monitoring results show no detectable levels of beryllium, the exposure level should be recorded as the limit of quantitation of the sampling and analytical method used (e.g., 0.01 $\mu g/m^3$) . The limit of quantitation is defined as the lowest concentration that can be reported reliably, that is, with a high degree of statistical certainty (Quality Assurance Manual for Industrial Hygiene Chemistry, American Industrial Hygiene Association, Sampling and Laboratory Analysis Committee, 1995, pages 36-38).

7. TWA<LOQ: Indicate by Y/N whether the value reported in field 6 is the 8-hour TWA limit of quantitation rather than the actually measured and calculated TWA exposure level. "Yes" indicates that the value reported in field 6 is the 8-hour TWA level of quantitation.

Table 8. Non-DOE Beryllium Activities and Exposure

	Name	**Description**
1.	*Site Code	Site code (provided by ORISE Data Center)
2.	*Unique ID	Unique employee identifier (provided by data coordinator)
3.	*Status Code	N = new record C = change to a record
4.	*Building Code	Building where the exposure occurred
5.	*Room/Area	Room/area where exposure occurred
6.	*Process	Free form text describing beryllium activity process
7.	*Operation	Free form text describing the beryllium activity operation
8.	*Task	Free form text describing the beryllium activity task

9.	*Actual Exposure	Actual exposure level or limit of quantitation during the sampling period in $\mu g/m^3$
10.	*Actual Exposure<LOD	Indicate whether the actual exposure is less than the limit of quantitation, Y/N.
11.	Exposure Duration	Number of hours of exposure from performing Task (field 8)
12.	Exposure Method	Type of exposure method: Individual (I), Representative (R), Presumed (P)
13.	Sampling Method	Describe the sampling method used
14.	Analytic Method	Describe the analytic method used
15.	*Exposure Sampling Time	Exposure sampling time (min.)
16.	*Sample Number	Sample identification number
17.	*Monitoring Date	Date monitoring was conducted - MM/DD/YYYY
18.	*Monitoring shift	Shift monitoring was conducted
19.	Chemical	Free form text describing beryllium chemical compound
20.	Engineering Controls	Free form text describing engineering controls
21.	PPC&E	Personal protective clothing and equipment used? Y/N
22.	*Respirator Protection	Respiratory protection used? Y/N
23.	*Respirator APF	Respiratory protection Applied Protection Factor

1. Site Code: A unique code that identifies a site. The Data Center will provide a site code to each data coordinator. Data coordinators currently participating in the Epidemiologic Surveillance Program should continue to use their previously identified site codes.

2. Unique ID: This is an encrypted identification number unique to each beryllium-associated worker. It is assigned by the site and is used to link multiple records to one worker. Every record submitted to the Data Center must include the Unique ID. Sites enrolled in the Epidemiologic Surveillance Program (ESP) should use the workers' ESP identifiers as the Unique ID.

3. Status Code: This indicates whether this is a new ("N") or change ("C") record for a worker's beryllium exposure. See "New and Change Records and Required Fields" section for additional discussion.

4. Building Code: Provide the on-site code for the building within which the beryllium exposure occurred. This is the unique administrative code that usually is established by the facility or property management organization for each building on site. The Registry coordinator must provide a data dictionary (the code and the building associated with that code) to the Data Center.

5. Room/area: Provide the room number or other identifier of the area where the beryllium exposure occurred.

6. Process: Free form text that describes the beryllium activity process. Process is the highest level of grouped tasks. Dry machining is an example of a process. See Appendix C for more examples.

7. Operation: Free form text that describes the beryllium activity operation. Operation is the mid-level of grouped tasks. Using a particular type of lathe is an example of an operation in the dry machining process. See Appendix C for more examples.

8. Task: Free form text that describes the beryllium activity task. Task is the lowest level of beryllium activity and is not grouped. Machine preparation is an example of a task performed in the operation of using a particular type of lathe. See Appendix C for more examples.

9. Actual Exposure: Provide the actual level of the worker's beryllium exposure during the sampling period for the Task (field 8) as determined by personal monitoring of the worker or by the representative monitoring of other workers, or presumed by some other method. (Indicate the exposure method in Exposure Method (field 12).) The industrial hygienist must calculate the actual exposure before submitting data to the site Registry coordinator. The exposure level should be reported as the limit of quantitation if the monitoring result does not exceed that level (e.g., 0.01 $\mu g/m^3$) .

10. Actual Exposure <LOQ: Indicate by Y/N whether the value reported in Actual Exposure (field 9) is the actual exposure limit of quantitation rather than the actual measured exposure level. "Yes" indicates that the value reported in field 9 is the actual exposure level of quantitation. The limit of quantitation is defined as the lowest concentration that can be reported reliably, that is, with a high degree of statistical certainty (Quality Assurance Manual for Industrial Hygiene Chemistry, American Industrial Hygiene Association, Sampling and Laboratory Analysis Committee, 1995, pages 36-38).

11. Exposure Duration: Provide the number of hours in the reporting period during which the worker worked on the task described in the Task (field 8), if possible. Although optional, efforts should be made to collect these data. Sources of this information often include supervisor's production records, payroll records, completed work packages, and regulated area sign-in sheets.

12. Exposure Method: Provide the type of exposure method. Individual (I) indicates that the exposure level was obtained from samples that were taken in this worker's breathing zone. Representative (R) indicates that the exposure value was obtained from samples that were taken in the breathing zones of other workers who were performing tasks similar to the task described in Task (field 7). Presumed (P) indicates that the exposure value was estimated by some other method, including subjective methods.

13. Sampling Method: Describe the sampling method used.

14. Analytic Method: Describe the analytic method used.

15. Exposure Sampling Time: The length of time of the sampling that generated the actual sample exposure level, Actual Exposure (field 10), or analogous time for exposure levels that were obtained from samples that were taken in the breathing zones of other workers who were performing tasks similar to the task described in Task (field 8), or were presumed by estimating by some other method, including subjective methods.

16. Sample Number: Identifying number assigned to the sample that generated Actual Exposure (field 10) for tracking purposes. Sites must ensure that the sample number does not identify the employee.

17. Monitoring Date: The date on which the monitoring was conducted that generated the actual exposure level used in calculating the 8hrTWA (field 6 in Table 7). Use the date of the first day if the monitoring spans midnight.

18. Monitoring Shift: Shift in which exposure monitoring was conducted that generated the actual exposure level used in calculating the 8hrTWA (field 6 in Table 7). Typical shift values are: 1) first, 2) second, or 3) third.

19. Chemical: Free form text that identifies the chemical composition of the beryllium being

monitored.

20. Engineering Controls: Free form text used to indicate type of engineering controls used with the Task (field 8).

21. PPC&E: Indicate whether personal protective clothing and equipment was used with the Task (field 8).

22. Respirator Protection: Indicate whether respiratory protection was used with the Task (field 8).

23. Respirator APF: Provide the Applied Protection Factor for respiratory protection when it was used for the Task (field 8).

New and Change Records

New and Change Records. The Registry uses a data management concept of “new” and “change” records. Records initiated for workers entering the Registry, or that provide new information in key specified fields for workers already in the Registry, are designated new ("N"). All other records submitted for workers already in the Registry are designated change ("C"). The change records provide newer, updated, or corrected information in the fields other than the key specified field. No records need be submitted for workers already in the Registry for whom no data is new or changed since the last submittal. New and change records are further explained in the Key Fields and Required Fields section below.

It is anticipated that there will be a low volume of “change” records since these records are to be basically used for (1) correcting erroneously submitted data and (2) updating fields as workers’ employment/job status changes. Make sure the status code is “C” in all “change” records. If this is overlooked or omitted, it will be treated as a “new” record and errors will result from conflicting with an existing record.

Key Fields

Using the concept of “new” and “change” records means each site has to understand how to effectively and correctly use these record types. There are key fields identified for each table and these allow the Registry to accurately match an incoming “change” record with an existing “new” record and do the updating correctly. A discussion of each table and how to submit “change” records follows:

Roster Table

The roster table has two key fields – Site Code and Unique ID. This means that every change record that is submitted must have these two fields in the record, plus any new or corrected value in other fields that is being submitted.

Medical Surveillance

This table has four key fields – Site Code, Unique ID, LPT result, and LPT date. The medical surveillance data centers around LPTs for an individual so each LPT must be submitted on a separate record. Should a change record be submitted for a record in this table, the four key fields plus any updated fields/values should be in the record.

Work History

The work history table has two key fields – Site Code and Unique ID. If a change is needed, these two fields plus the updated fields/values in the affected field should be included in the “change” record.

Beryllium Task 8-Hour Time Weighted Average

The Task 8-Hour Time Weighted Average table has four key fields – Site Code, Unique ID, Monitoring Date, and Monitoring Shift. These fields, when put together, allow for a unique identification of a record in this table. Based on this, there are actually only two fields that can be "changed" – the TWA and the TWA<LOD indicator. However, should this need occur, the four key fields plus the updated value/field must be included in the "change" record.

Beryllium Activities and Exposure

The Activities and Exposure table has five key fields – Site Code, Unique ID, Actual Exposure, Monitoring Date, and Monitoring Shift. To submit a "change" record, these five fields must be included plus any updated fields/values.

Table Relationships

All tables can be related to one another by concatenating the Site Code and Unique ID as a key. This will allow any records in any tables to be related to any other table. However, there are some logical relationships that also exist. The Roster table is the driving source of the Registry. All medical surveillance, work history, task time-weighted average, and activities/exposure records must match to a Roster table record via the Site Code/Unique ID key. If not, these records will be questioned and returned to the site for resolution.

The Medical Surveillance table is not related logically to the Work History, Task 8-Hour Time Weighted Average or Activities and Exposure table, and there can be a many-to-one relationship from the medical surveillance table to the roster.

The Work History table is related logically to the roster only by the Job Stop Date and the Date Employment Ended. A worker cannot have a Job Stop Date that is later than a Date Employment ended (i.e., they cannot be working on a job later than their employment existed). The Task 8-Hour Time Weighted Average table is logically related to the Work History table by dates. The Monitoring Date field must have a value that is in between the Job Start and Job Stop Dates. There is a many-to-one relationship between the Task 8-Hour Time Weighted Average table and the Work History table. The Activities and Exposure table relates logically to the Task 8-Hour Time Weighted Average table in a many-to-one fashion through the Monitoring Date field. If a Task 8-Hour Time Weighted Average table record exists with a TWA associated with a particular Monitoring Date, there should be at least one Exposure record with that same Monitoring Date value.

Required Fields

Every record must contain the worker's Unique ID and Site Code. This allows all the records on

an individual worker to be linked. In addition to the Unique ID and Site Code, selected fields in all the data sets must be populated every time data is submitted. These fields are indicated by * in the tables.

Quality Assurance

The Data Center performs edit and logic checks on the data as part of its quality assurance procedures. The integrity of the Activities and Exposure Data Set is achieved by maintaining the chronological order of a worker's job history. For example, if a record is submitted with a stop date for a beryllium activity, there must be a prior record with an activity start date.

The unique identification number of a record submitted for the medical surveillance, work history and exposure data sets must match a unique identification number of a record in the Roster data set. The Data Center will prepare a list of edit checks and furnish these to the data coordinator so that inconsistencies and errors can be resolved.

Appendix A - CBD Definitions

CBD, "C". Blood BeLPT confirmed positive, lung BeLPT positive, and lung biopsy shows granulomas. Exceptions: other criteria met, but biopsy shows single granuloma or micro-granuloma. Lung BeLPT negative, but biopsy shows granulomas and disease have progressed sufficiently that treatment is required, with no other explanation for lung findings.

CBD "B". Positive blood and lung BeLPT's, plus evidence of lung pathology that cannot be explained by another disease process after a through clinical evaluation. The evidence of lung pathology may include: 1) biopsy shows a lymphocytic process consistent with CBD, 2) computerized axial tomography (CT) scan shows changes consistent with CBD; or 3) pulmonary function or exercise testing shows pulmonary deficits consistent with CBD. Blood and lung Be-LPT negative, but patch test positive and biopsy shows granulomas or biopsy shows other findings consistent with CBD with additional pulmonary findings not explained by another disease process. Blood BeLPT positive, lung BeLPT negative, biopsy shows granulomas, and other pulmonary findings are present not explained by another disease after a through medical evaluation.

CBD "A". Blood BeLPT confirmed positive, lung BeLPT positive, and biopsy: 1) not done; 2) negative; or 3) explained by another pulmonary condition. Positive blood LPT, negative lung LPT, and biopsy showing granulomas or other findings consistent with CBD, but without other pulmonary findings (unless explained by another disease).

Appendix B – FAQ

General Questions

Q. – Where do I get the site code?

A. – That is a number that is furnished to you by the Registry Data Center

Q. - Will others be able to request and receive data I have submitted from my site?

A. - No. Data can be returned only to the site that provided it.

Q. – Can I get a copy of the list where numbers are assigned to each site?

A. – No. As an extra step to help protect the identity and confidentiality of the workers, this list will be maintained at the Registry Data Center and will not be give to anyone else.

Q. – Are self-identified beryllium workers to be included in the Registry?

A. – Yes.

Roster Questions

Q. – When the roster is submitted in January, 2002, do we submit all the roster records again in July, 2002 with the changes incorporated?

A. – No. Once the roster has been submitted in January, 2002, all of those workers will be in the roster forever and there is no need to submit them again unless they (1) have some piece of data in error that you have detected and wish to correct, (2) terminate/retire, or (3) expire.

Q. – When submitting the roster for the first time, the "Date Employment Ended" field is required, but the roster is for current workers only, so how is this field populated?

A. – This field is blank (null) when the roster is submitted for the first time. As workers exit from the workforce, "change" records will be submitted to update this field for the affected worker.

Q. - At our site, it is common for an employee to jump from one employer to another. Do I fill out a roster record each time this occurs.

A. – If this is an employee that you as a site are responsible for reporting into the Registry, then the answer is "YES". If this occurs, you should have the person in the roster already and a "change" record for this person should be submitted updating the "Date Employment Ended" field

so it now has a value (thus indicating the person has left this company). A "new" roster would be submitted (assuming that he/she is still a "beryllium-associated worker") and the "Date Employment Ended" field would be blank.

Q. – We seldom get death certificates or any death information. What do we supply when we know the person has deceased?

A. - Every effort should be made to get these data but if they are not obtainable, it is advisable to put "N/A" in the field and that will give the Registry an indication the person is deceased but the data are not available.

Medical Surveillance Questions

Q. – Once a person has a LPT and (for example) has another one a year later, is the second LPT submitted as a "change" record?

A. – No. The design of the Medical Surveillance data table is centered around the LPT test and each time a person has a LPT, a record must be submitted, so in this case the person would have two "new" records in the table, one for each LPT.

Q. – Sometimes a person has the option of taking a chest X-ray and spirometry even if the LPT is normal. Do we submit these values anyway?

A. – Yes. Submit any test results requested by the Registry that the person may have, regardless of the LPT result.

Q. – It is near July and time to submit data to the Registry. There are some LPTs that are what might be called "still in progress" – that is, the results are such that other tests are being performed, but the results for these tests have not been submitted to OccMed. Should we wait until we receive these and then submit the record, or submit what we have and do "change" records to update these other fields later?

A. – It is recommended that you just wait until all of the test results come in and submit the record just one time. This will save you some record tracking and it will make it easier on the Registry staff also. Remember the January and July dates are not the ONLY times you can submit data. The Registry Data Center will accept data whenever a site sends it.

Work History

Q. – Due to security reasons, the job title cannot be provided. Is it acceptable to leave it blank?

A. – It is desirable to have some value here, so a generalization is recommended so the field is not blank. This will give some indication of what the person was doing to become identified as a beryllium-associated worker.

Q. – The "Job Stop Date" is a required field but if these are current workers, when should I leave this field blank (null) and when should I populate it?

A. – If the worker is currently employed and is currently in the job that identified him/her as a beryllium-associated worker, then this field is left blank (null), thus indicating the person still performs this job. However, some sites have indicated that they plan to go back in their archives and retrieve some older data (i.e., prior to January 7, 2002) and will submit that to the Registry. The Registry staff is looking forward to this because the more of these data that can be collected, the more robust the Registry will be. For these retrospective records, this field will be populated as these workers quit these jobs that qualified them as beryllium-associated or were moved to other jobs.

Q. - Suppose a person is identified as a beryllium-associated worker and a "new" work history record is submitted indicating the job he/she is working that establishes them as a beryllium-associated worker. If the person works in this job for six months, does some non-beryllium related job for three months, and then returns to a beryllium job, how is all of this submitted?

A. – Once the "new" work history record is submitted, a "change" record would be submitted for that job containing the Job Stop Date. Three months later, when the worker returns to a beryllium job, a "new" work history record would be submitted with the appropriate fields populated. This would mean this person now has two "new" work history records and this allows a comprehensive, chronological work history can be derived for this person.

Q. – Are sites required to retrieve retrospective work history data for beryllium workers?

A. – According to the rule, the answer is no, although these data would increase the value of the Registry and some sites have said they can do this easily and will do so.

Beryllium Task 8-Hour Time Weighted Average table

Q. – What should be the value provided in the Process field if security implications arise?

A. – Again, some form of generalization for the value is desired that would give the Registry data values that are as detailed as possible but do not breach security restrictions.

Q. - Assume a site submits data on the six month schedule and a worker has been monitored for exposure while performing150 processes during that period. What should be submitted?

A. – There would be 150 "new" DOE Beryllium Task 8-Hour Time Weighted Average table records for that person, assuming a 8-hour TWA was calculated each time, and there would be 150 (or more) DOE Activities and Exposure table records with each record containing the appropriate data for monitoring the process to which it relates.

Activities and Exposure Table

Q. – Again, security concerns arise with combining data from the DOE Activities and Exposure table, particularly the fields Process, Operation, and Task. What should a site do in this case?

A. - Generalizations are recommended for the values in these fields that allow the Registry to have data that are as detailed and complete as possible without breaching security restrictions. Each site has to assess their own situation and develop a data policy/procedure they are comfortable with, ensuring that security is not compromised.

Q. – The Sample Number field can be traced to an individual. To protect confidentiality, what should a site do?

A. – Notice that this field is not required, but some sites asked/recommended that it be included to make it easier to search samples for specific values or to answer questions that may arise from these data. Most sites have procedures to maintain confidentiality of sampled individuals. If a site wants to use some form of encryption, that is acceptable. This field is there primarily for the site's use.

Q. – What happens if one 8-hour TWA is computed from several samples?

A. – The design of the database is such that a one-to-many relationship can exist from the DOE Beryllium Task 8-Hour Time Weighted Average table to the DOE Activities and Exposure table, so this can be accomplished.

Q. – Is there a limit to the amount of text that can be supplied for the Process field?

A. – No, the field is virtually limitless.

Appendix C – Process-Operation-Task Examples

PROCESS	OPERATION	TASK
ORY MACHINING	HARDINGE LATHE	MACHINE PREP
ORY MACHINING	HARDINGE LATHE	OPERATING LATHE
ORY MACHINING	HARDINGE LATHE	CLEAN UP
ORY MACHINING	HARDINGE LATHE	MAINTAIN EQUIPMENT
ORY MACHINING	BRIDGEPORT MILL	MACHINE PREP
ORY MACHINING	BRIDGEPORT MILL	OPERATING MILL
ORY MACHINING	BRIDGEPORT MILL	CLEAN UP
ORY MACHINING	BRIDGEPORT MILL	MAINTAIN EQUIPMENT
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAYING	POWDER/CHAMBER INSPECTION
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAYING	ATTACH/REMOVE CANISTERS
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAYING	LOAD SAMPLE
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAYING	SPRAY OPERATION
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAYING	BLOW DOWN
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAYING	PART TRANSFER
ANALYSIS	ICP BERYLLIUM ANALYSIS	PREP STANDARDS
ANALYSIS	ICP BERYLLIUM ANALYSIS	INSTRUMENT ANALYSIS
ANALYSIS	ICP BERYLLIUM ANALYSIS	SAMPLE RECEIVING AND PREPARATION
ANALYSIS	ICP BERYLLIUM ANALYSIS	DATA MANAGEMENT AND REPORTS
ANALYSIS	ICP BERYLLIUM ANALYSIS	WASHING GLASSWARE AND GENERAL HOUSEKEEPING
ANALYSIS	ICP BERYLLIUM ANALYSIS	CHEMICAL STORAGE AND WASTE MANAGEMENT
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAY OPERATIONS	VACUUM PUMP MAINTENANCE
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAY OPERATIONS	TORCH MANIPULATOR MAINTENANCE
ES&H SUPPORT	SAMPLE COLLECTION	TAKE AIR SAMPLES
ES&H SUPPORT	SAMPLE COLLECTION	TAKE SWIPE SAMPLES
ES&H SUPPORT	SAMPLE COLLECTION	TAKE VACUUM/BULK SAMPLES
ES&H SUPPORT	INSPECTION, EVALUATION, AND INVESTIGATION	VERIFY ADMINISTRATIVE CONTROLS
ES&H SUPPORT	INSPECTION, EVALUATION, AND INVESTIGATION	PERFORM GENERAL WALKTHROUGHS
ES&H SUPPORT	INSPECTION, EVALUATION, AND INVESTIGATION	PERFORM PHYSICAL HAZARD EVALUATIONS
ES&H SUPPORT	INSPECTION, EVALUATION, AND INVESTIGATION	EVALUATE ENGINEERING CONTROLS
ES&H SUPPORT	INSPECTION, EVALUATION, AND INVESTIGATION	EVALUATE CHEMICAL HAZARDS
ES&H SUPPORT	EQUIPMENT MAINTENANCE	CLEANING AND PACKAGING
ES&H SUPPORT	EQUIPMENT MAINTENANCE	CALIBRATING, ADJUSTING, AND TROUBLESHOOTINC
ES&H SUPPORT	SHORT-TERM HCP OPERATIONS	SUPPORTING A LOW RESIDUAL RISK OPERATION
ES&H SUPPORT	SHORT-TERM HCP OPERATIONS	SUPPORTING A MINIMAL RESIDUAL RISK OPERATION
ES&H SUPPORT	SHORT-TERM HCP OPERATIONS	SUPPORTING A MEDIUM RESIDUAL RISK OPERATION
CUSTODIAL/JANITORIAL	EQUIPMENT DECON	WET WIPING
CUSTODIAL/JANITORIAL	EQUIPMENT DECON	STRIPCOAT REMOVE
CUSTODIAL/JANITORIAL	EQUIPMENT DECON	HEPA FILTERED VACUUMING

CUSTODIAL/JANITORIAL	GENERAL DECON	WET MOPPING
CUSTODIAL/JANITORIAL	GENERAL DECON	STRIPCOAT REMOVE
CUSTODIAL/JANITORIAL	GENERAL DECON	HEPA FILTERED VACUUMING
DECONTAMINATION	GENERAL DECON	APPLYING STRIPCOAT
DECONTAMINATION	GENERAL DECON	SETTING UP/TEARING DOWN
DECONTAMINATION	GENERAL DECON	REMOVING STRIPCOAT
DECONTAMINATION	GENERAL DECON	WET MOPPING
DECONTAMINATION	GENERAL DECON	WET WIPING
DECONTAMINATION	GENERAL DECON	HEPA FILTERED VACUUMING
DECONTAMINATION	EQUIPMENT DECON	SETTING UP / TEARING DOWN
DECONTAMINATION	EQUIPMENT DECON	APPLYING STRIPCOAT
DECONTAMINATION	EQUIPMENT DECON	REMOVING STRIPCOAT
DECONTAMINATION	EQUIPMENT DECON	WET MOPPING
DECONTAMINATION	EQUIPMENT DECON	WET WIPING
DECONTAMINATION	EQUIPMENT DECON	HEPA FILTERED VACUUMING
DECONTAMINATION	LAUNDRY	COLLECTING LAUNDRY
DECONTAMINATION	LAUNDRY	WASHING/DRYING LAUNDRY
DECONTAMINATION	LAUNDRY	FOLDING/STORING LAUNDRY
DECONTAMINATION	HEPA VACUUM MAINTENANCE	CHANGE PAPERBAG, MAIN & MICRO FILTERS
DECONTAMINATION	HEPA VACUUM MAINTENANCE	CHANGE ULPA/HEPA FILTERS
DECONTAMINATION	DRYER LINT COLLECTOR	REMOVING LINT
DECONTAMINATION	DRYER LINT COLLECTOR	CHANGING LINT BAG
DECONTAMINATION	OVERHEAD DECON	WET WIPING
DECONTAMINATION	OVERHEAD DECON	HEPA FILTERED VACUUMING
GLOVEBOX MAINTENANCE	INSPECTION	TRANSFER GLOVEBOX INSPECTION
GLOVEBOX MAINTENANCE	INSPECTION	PLASMA SPRAY CHAMBER GLOVEBOX INSPECTION
GLOVEBOX MAINTENANCE	GLOVE CHANGE	TRANSFER GLOVEBOX GLOVE CHANGE
GLOVEBOX MAINTENANCE	GLOVE CHANGE	PLASMA SPRAY CHAMBER GLOVEBOX GLOVE CHANGE
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAY MAINTENANCE	TORCH MAINTENANCE
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAY MAINTENANCE	VACUUM PUMP MAINTENANCE
POWDER OPERATIONS	BERYLLIUM PLASMA SPRAY MAINTENANCE	POWDER HOPPER MAINTENANCE
POWDER OPERATIONS	GLOVEBOX MAINTENANCE	INSPECTION
POWDER OPERATIONS	GLOVEBOX MAINTENANCE	GLOVE CHANGE
PARTICULATE CONTAINER HANDLING	CYCLONE CONTAINER CHANGE-OUT	REMOVING/INSTALLING CONTAINER
PARTICULATE CONTAINER HANDLING	CYCLONE CONTAINER CHANGE-OUT	POST OPERATION CLEAN-UP
PARTICULATE CONTAINER HANDLING	DUST COLLECTOR CANISTER CHANGE-OUT	REMOVING/INSTALLING CONTAINER
PARTICULATE CONTAINER HANDLING	DUST COLLECTOR CANISTER CHANGE-OUT	POST OPERATION CLEAN-UP
FACILITY OPERATIONAL SUPPORT	SHORT TERM HCP	RESIDUAL RISK MEDIUM
FACILITY OPERATIONAL SUPPORT	SHORT TERM HCP	RESIDUAL RISK LOW
FACILITY OPERATIONAL SUPPORT	SHORT TERM HCP	RESIDUAL RISK MINIMAL
FACILITY OPERATIONAL SUPPORT	ROUTINE MAINTENANCE	
FACILITY OPERATIONAL SUPPORT	ROUTINE INSPECTION	INSPECTING SAFETY SHOWERS & EYEWASH
FACILITY OPERATIONAL SUPPORT	ROUTINE INSPECTION	INSPECTING FIRE EXTINGUISHERS
FACILITY OPERATIONAL SUPPORT	ROUTINE INSPECTION	INSPECTING EMERGENCY LIGHTING

FACILITY OPERATIONAL SUPPORT	ROUTINE INSPECTION	INSPECTING COMBUSTIBLE LOADING
ENVIRONMENTAL SAMPLING	BERYLLIUM PRECISION MACHINE SHOP	EDM MACHINING
FACILITY OPERATIONAL SUPPORT	ROUTINE SURVEILLANCE & CALIBRATION	SURVEYING HVAC SYSTEM PID/PDIP
FACILITY OPERATIONAL SUPPORT	ROUTINE SURVEILLANCE & CALIBRATION	SURVEYING LOCAL VENTILATION ALARMS
ELECTRICAL SERVICE/INSTALLATION/REPAIR	SERVICE	
ELECTRICAL SERVICE/INSTALLATION/REPAIR	INSTALL	
ELECTRICAL SERVICE/INSTALLATION/REPAIR	REPAIR	
ELECTRICAL SERVICE/INSTALLATION/REPAIR	SCOPE WORK TICKET	
CONSTRUCTION/MAINTENANCE OPERATIONS	GENERAL MAINTENANCE	
WELDING	PIGMA WELDING	
WELDING	LEAK CHECK	
WELDING	RESTRAINED BEND	
WELDING	MAINTENANCE	